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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/577,545	09/11/2006	Ib Helmer Nielsen	PATRADE	2263
7590	08/29/2007	EXAMINER		
James C. Wray 1493 Chain Bridge Road Suite 300 McLean, VA 22101			LEUNG, KA CHUN A	
ART UNIT		PAPER NUMBER		
		3747		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/577,545	NIELSEN, IB HELMER
	Examiner	Art Unit
	Ka Chun Leung	3747

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 06 August 2007.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) 6-10 is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-5 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 28 April 2006 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>07/20/2006</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| | 6) <input type="checkbox"/> Other: _____. |

DETAILED ACTION

1. This Office Action is in response to Applicant's reply filed on 08/06/2007.

Election/Restrictions

2. Applicant's election with traverse of Group I (Claims 1-5) in the reply filed on 08/06/2007 is acknowledged. The traversal is on the ground(s) that "that the claims are not distinct" and in particular addresses that the examples provided "on page 2, section 2, lines 5-13" of the restriction requirement are "suggested features not as claimed". This is not found persuasive because the cited examples, and in particular the use of a resolver, is distinctly recited in Claim 5. Thus the inventions are shown to be distinct since a materially different product utilizing a rotary encoder or syncro in place of a resolver could be employed to practice the method of Group II.

3. The requirement is still deemed proper and is therefore made FINAL.
4. Claims 6-10 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 08/06/2007.

Priority

5. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

6. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the sensors displaced in the circumferential direction of the main, as recited in Claim 4, must be shown or the feature(s) canceled from the claim(s). Presently the sensors (74, 76, 80) in Figure 4 are shown to be arranged parallel to the main shaft (44) as opposed to circumferentially around the main shaft (44). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

IRIE et al

9. Claims 1 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over IRIE et al (DE 39 09 772 A1). IRIE et al discloses a lubrication device (21) for providing lubricating oil to the cylinders of a combustion engine comprising a plunger (22), a cam (23), an oil inlet (24), an intake valve (25), an exhaust valve (26), a discharge opening (27), a rocker arm (28), and an eccentric shaft (29). IRIE et al further discloses in the last paragraph of Column 1 that the lubrication device (21) is "electronically propelled" and provides a device (5) for adjusting RPM and phase of the drive shaft (3). Additionally in the last paragraph of Column 3, IRIE et al discloses a set of crank angle and speed sensors for the both engine and lubrication device drive shaft connected to a

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control unit (100). However, IRIE et al does not distinctly disclose the device (5) as being an AC motor.

10. It is well known in the art to provide an electric motor to electrically drive or "propel" a shaft (i.e. a starter motor, windshield wiper motor, etc.). Furthermore, it is known in the art to provide an AC type motor to utilize an AC power source such that no additional conversions are necessary (i.e. utilize power from an alternator).

11. Thus it would have been obvious to one of ordinary skill in the art to the lubrication device of IRIE et al with a known electric motor device to predictably power and rotate the drive shaft.

12. Specifically regarding Claim 1, IRIE et al notes that the drive shaft (3) for the lubrication device (21) is rotated synchronously with the number of revolutions of the engine and thus meets the limitation of "preferably" rotating a control shaft synchronously with the main shaft

13. Specifically regarding Claim 5, it is well known in the art of motors to provide encoders, resolvers, or other means of sensor systems to monitor the position, speed and direction of movement of the motor to provide feedback (for examples see US Patent 5,408,894 and US Patent 4,779,031).

14. This it would have been obvious to one of ordinary skill in the art to provide a resolver for feedback monitoring OF the AC motor's position, speed and direction of movement.

IRIE et al and ONUMA et al

15. Claims 2-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over IRIE et al (DE 39 09 772 A1) in view of ONUMA et al (US Patent 6,058,766).

16. IRIE et al discloses a lubrication device (21), a crank angle detector (8) and a RPM/speed detector (9) for the engine. However IRIE et al does not distinctly disclose providing a reference means to detect the position of the engine crankshaft.

17. It is well known in the art to provide some type of "reference means" attached to the crankshaft in order for a crank angle sensor to detect the position of the engine.

18. ONUMA et al, for example, provides a disk shaped rotary body (1) mounted to the crankshaft and provides electromagnetic pickups (3a and 3b) to generate a pulse the convex portions (2) passes by. By generating two signals, the crank angle detector is capable of accurately identifying a reference position time for a rotating angle of a crankshaft.

19. Thus it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have provided the crank angle detector of IRIE et al with a disk shaped rotary body and two electromagnetic pickups, in light of the teachings of ONUMA et al, in order to accurately identify a reference position time for the crankshaft.

20. Specifically regarding Claim 2, the crank angle detector and RPM/speed detector would inherently detect angular position and speed.

21. Specifically regarding Claim 3, the two electromagnetic pickups of ONUMA et al are mutually displaced from one another along the circumference of the rotary disk.

IRIE et al, ONUMA et al, and KATOGI et al

22. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over IRIE et al and ONUMA et al as applied to Claim 3 above, and further in view of KATOGI et al (US Patent 5,945,828)
23. IRIE et al discloses a lubrication device (21), a crank angle detector (8) and a RPM/speed detector (9) for the engine. ONUMA et al, for example, provides a disk shaped rotary body (1) mounted to the crankshaft and provides electromagnetic pickups (3a and 3b) to generate a pulse the convex portions (2) passes by. However, neither reference discloses the use of an index reference means.
24. KATOGI et al discloses an engine combustion condition detecting apparatus comprising a crank angle sensor (103) connected to an engine control unit (120). KATOGI et al further discloses providing a reference sensor (105) for indicating a specific crank angle. In addition, a malfunction judging unit (207) is provided to detect the occurrence of misfire by determining whether the signal outputted by the reference sensor (105) is constant.
25. Thus it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have provided the crank angle detector of IRIE et al and ONUMA et al with a malfunction judging unit and reference sensor, in light of the teachings of KATOGI et al, in order to provide a means for detecting engine misfire.

Conclusion

26. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. KANEAGE (JP 55-142233) has been cited to show a related crank angle sensor with two sensors (5, 6) arranged parallel to the crankshaft, the first sensor providing a pulse at every crank angle of 2 degrees, while the second providing a pulse at every crank angle of 120 degrees.
- b. HAYES et al (US 5,040,507) has been cited to show a cam (44) connected to and rotated by a DC motor (64).
- c. YTTERBERG (US patent 3,367,250) has been cited to show a AC-DC motor used to drive an eccentric cam member (13).

27. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ka Chun Leung whose telephone number is (571) 272-9963. The examiner can normally be reached on 7:30AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Cronin can be reached on (571) 272-4536. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ka Chun Leung
Examiner
Art Unit 3747



STEPHEN K. CRONIN
SUPERVISORY PATENT EXAMINER